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THE RELATIONSHIP BETWEEN INTEGRATED EXAMINATION MODULE AND INDIVIDUAL LEARNER MANAGEMENT IN PUBLIC SECONDARY SCHOOLS IN KERICHO COUNTY, KENYA

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Abstract

This study examines the relationship between the integrated examination module and individual learner management in public secondary schools in Kericho County. The Adaptive Structuration Theory (AST) and Data to Knowledge Process Model guided the study. The study used a correlation survey research design. The unit of sampling was the schools. The target population comprised 273 directors of studies (DOS) from 273 schools in Kericho County. Stratified random sampling was employed to obtain a sample of 140 DOS. Data was collected using a questionnaire. The reliability of the research question was determined using Cronbach's Alpha Coefficient, and it yielded a reliability coefficient of 0.74. The data collected were then analysed using Statistical Package for Social Sciences (SPSS) version 20. The data were analysed using descriptive and inferential statistics and presented using tables and narrations. The study established the respondents used the examination module to collect and analyse assessment data, with an overall mean of 3.56. The respondents also used the analysed data to manage individual learners, with an overall mean of 3.55. Further, the study established that there was no significant relationship between the examination module and individual learner management n (114) =0.391 $p > 0.05$ = R^2 0.07. The study recommended the introduction of compulsory and frequent compulsory courses on data management for all school staff members by the government and that measures be put in place to ensure that collected data is used to make a decision on individual learners.

Key terms: Examination module, individual learner management.

1.0 INTRODUCTION

Assessments in schools are what determine a learner's academic progress in school. Results obtained from assessment provide evidence of student, school and teacher performance (OECD, 2015). In addition, it provides information to policymakers, parents, and society about educational performance, school improvement, school leadership and school practices (OECD, 2013). To achieve the above-mentioned purposes, assessment results should be collected, analysed, and well-stored in a manner that makes them easy to retrieve. This is only possible with the use of a well-managed exam system. The exam management system is an all-in-one solution for managing exams at an institution (Scientia, 2017). Exams can be managed manually or electronically. According to Wang and Zheng (2018), an automated examination management system can be divided into four functional modules: grade/score management, question bank management module, user management module, and examination management module. Grade management allows the user to add a query and delete or modify scores. The question bank management allows the user to query, add, delete, modify and randomly generate tests. The user management allows adding, querying, deleting, and modifying information about the user and setting user permissions. Lastly, the examination management module classifies the exams and sets the time for the exam.

A lot of data collected in school is academic data, so as to monitor the learners' progress. This data can be used in various ways, including subject selection. Odede (2017), Allen (2019) and Doughety (2015) observed that data on assessment can be used positively to assist individual learners in improving their grades in their respective subjects and, in the long run, improve the school grade. Mogaka et al. (2019) and Wanja (2017) established that school subject selection is mainly based on the learners' performance. Automation of the exam system has a lot of benefits to the school administration, including ease in the collection and analysis of exams, easy retrieval and modification of information, and safety and accuracy of data (Makinia, 2014; Ziraba, 2010). Assessments in schools are what determine a learner's academic progress in school.

Schools have put systems in place to collect data on learners. This data is collected from the first day when the learner reports to school. In relation to student performance, learners are supposed to report with their KCPE results. This forms the basis of learners' progress reports. Schools should monitor learners' progress from their first assessment exams until they sit for their KCSE exams. By doing so, they will be assisted individually to improve their weak areas. With the introduction of free secondary education, the population in schools is high, and as a result, teachers rarely concentrate on individual learners but on the class as a whole. As a result, most learners exit secondary school before they attain their full academic potential. The integrated examination module is supposed to make work easier for the teachers and enable them to have extra time to deal with individual learners. However, there is little indication that the learning institutions are using analysed performance data to manage individual learners. There is a need to examine whether the teachers' concern with assessment targets individual learners.

2.0 LITERATURE REVIEW

Studies have shown that schools collect a lot of data on academics. The reason behind this is the fact that the core function of the school is to ensure that the learner performs well academically. Mogaka et al. (2019) studied the role of parents and students in students' subject selection in agriculture. The study adopted a survey design. The target population was the school principals, teachers and students. Stratified

random sampling was adopted to sample the respondents to participate in the study. The questionnaire was the only instrument used to collect data from the respondents. One of the objectives of the study is to establish what influences agricultural selection by the students. The performance in agriculture was cited by 29(74.3%), 9(23.1%) cited parents and teachers' influence and 1(2.0%) cited school policy. The study shows that the school under study uses performance data to decide on subjects to be selected by the learners.

Studies have shown the advantages of using automated examination systems. For example, a study by Makinia (2014) indicated the benefits derived from using ICT in examination analysis as; fast analysis (39.1%), ability to analyse data comprehensively (34.8%), efficiency (26.1%), accuracy (26.1%), ability to make a plan and set targets (13%), ease to modify and retrieve data (8.7%) and affordability (8.1%). An efficient DBMS enables the above activities. A study by Ziraba (2010) on the role of information and communication technology in the selected secondary school management in Central Uganda sought to examine ICT in the management of students' records, examinations, school finances, and information flow in secondary schools. The study revealed that only 12 per cent of the schools in the study used ICT in examination management. The study further inquired into the effects of ICT in exam management, where 42.3 per cent of respondents established that ICT facilities had made tracking of students' academic progress effective, and 61.6 per cent agreed that the databases allowed accuracy in recording students' grades. The study further established that computer applications like Excel were used to compute students' grades to determine the pass mark grades and compute students' marks easily, making reports easy for the teachers (Ziraba, 2010). Based on the findings of this study, it can be established that although there was the application of ICT in exam management, the percentage was very low. In the schools studied, exam analysis and grading were done manually.

Odede's study (2017) on the perceived influence of ICT adoption on teachers' performance in public secondary schools in the Emuhaya Sub-county of Vihiga County required teachers to rate the influence of ICT adoption on learners' evaluation and achievement. The study adopted a cross-sectional survey with questionnaires and document analysis as research instruments. The respondents' views were captured using a Likert-scale questionnaire. Two items are of importance to the current study. One of the items stated that ICT shows historical subject means and hence areas of improvement. A total of 48.8 per cent of the respondents rated this as highly influencing learners' evaluation and achievement (Odede, 2017). Odede (2017) observed that teachers can use the stored data on performance to improve future results. The second item was that ICT creates an opportunity to develop and keep records for evaluating the learners. Of the respondents, 47.7 per cent rated this item as highly influencing learners' evaluation and achievement (Odede, 2017).

Continuous assessment tests and all forms of exams are stored using ICT and can be retrieved whenever needed. This saves time and brings order to learners' evaluation as repetition of the same questions can be avoided. If the stored exams are used well, they can assist in topical revision, enhancing learners' understanding. This, in turn, improves learners' achievement and attainment of better grades. The study by Odede (2017) examined the views of teachers on how ICT adoption influences learners' evaluation and achievement. The study dealt with how learners' evaluation results over time can improve subject mean grades and the use of ICT in the creation of an exam bank. The current study sought to establish the use of

evaluation results in other areas affecting individual learners, such as subject selection and study group formation.

Studies have also been carried out to establish how schools use the collected data on assessment. For example, Allen (2019) carried out a case study in England to establish how schools used data. The survey targeted teachers in state-funded schools. The teachers were asked whether they used assessment data from a test to guide their teaching. The results showed that 41 per cent of the teachers did not use attainment data to inform the teaching of their current class. This meant that whatever they taught in class was not based on individual or whole-class needs. The study further established that 41 per cent of teachers felt that their schools were collecting a lot of data that they were not using. The case study by Doughety (2015) sought to determine the use of data to support teaching and learning. One of the objectives was to determine the kind of data the two districts and school leaders used to assess the quality of teaching and learning in schools under their supervision, and how the data acquired was used. The study revealed that assessments were used to monitor student learning. The educators in the two districts described using the report on assessment in a variety of ways, including, firstly, that the teachers use reports by item or by the instructional objective to identify objectives that need to be re-taught to small groups of students or the entire class. Secondly, the teachers and school leaders used student-level performance reports to place students in intervention.

Thirdly, the teachers used the assessment data as evidence that they are closing the achievement gap. Lastly, the data was used to predict how well students were likely to do on the state test. Such an approach ensures that students are dealt with individually and not as a group. Hoover and Abrams (2013) studied the extent to which classroom teachers used summative assessment data. The study was a web-based survey investigation with 500 elementary, middle and high school teachers in Virginia as the respondents. Teachers reported using data to evaluate their instructional practices, making adjustments to support learning and regroup learners based on data. The study revealed that data to support decisions on individual learners was irregular and less often available. The three studies reviewed were not done in Kenya, and thus, there is a need to establish if the case is the same in Kenya, especially in Kericho County.

Adaptive Structuration Theory (AST), proposed by Desanctis and Poole (1994), guided the study. According to Desanctis and Poole (1994), AST examines the change process from two vantage points: the types of structures associated with advanced technologies and the structures that emerge as people interact with these technologies. Adaptive Structuration Theory presents a relationship between advanced information technologies, social structures, and human interaction (Desanctis & Poole, 1994). Certain measures have to be in place for this interplay to occur in school. The social structures provided by advanced information technology can be described in two ways: first, the structural features of the given technology, which are the specific types of rules and resources, or capabilities, offered by the system. Second is the spirit of the features. This is the general intent with regard to values and goals underlying a given set of structural features. It is the "official line" that the technology presents to people concerning how to act when using the system, the way to interpret its features, and how to fill in gaps in procedures which are not explicitly specified (Desanctis & Poole, 1994).

According to Desanctis and Poole (1994), structures already exist in institutions preceding the development of advanced technology. Designers then incorporate some of these structures into the technology by modifying them to fit the new technologies. Once complete, the technology presents a variety of social structures to be used to interact with others, accompanied by rules and resources. For example, in learning institutions, once the school management has acquired a new DBMS infrastructure, they should be able to incorporate it to fit into the existing systems within the school.

According to Sinclare and Vogus (2011), the new technology created may be similar or different from what was initially conceptualised by either the designer or the user, as it will depend on the social structures within the system and how the users interact with it. Learning institutions have integrated examination modules into their systems to manage learners' performances while in school. New technologies frequently emerge, bringing changes into school systems. Schools already have systems in place (features of technology). They include the hardware and software to assist in the management of Adaptive structuration theory assessment data. To achieve the spirit of the technology, schools should ensure that the school personnel are conversant with the system to be able to adopt new technologies and modify them to fit into the school systems. This can be achieved through in-service training. These systems should not only accomplish the work at hand but should also be able to bring about coordination among people, effectiveness, confidentiality, and efficiency.

The knowledge process model by Breiter and Light (2006) also guided the study. The model is a simplified version of Ackoff's organisation and management theory. The pyramid comprises three phases that start with raw data and end with meaningful knowledge used to make decisions. According to Ackoff (1989), information is contained in descriptions and answers to questions that begin with such words as what, when, who and how many. Information systems generate, store, retrieve, and process data. According to Breiter and Light (2006), this is where data is given meaning when connected to a context. According to Ackoff (1989), knowledge is the know-how that makes the transformation of information into instruction possible.

According to Ducker, as cited in Breiter and Light (2006), knowledge is information brought to an organisation by somebody to be used for decision-making. The model identifies six broad steps that data go through to transform into knowledge (Ackoff, 1989). The process entails collecting and organising data, summarising, analysing, synthesising, and then making decisions. In learning institutions, assessment data is collected whenever the learners are assessed. The data collected is useless if not analysed based on the institution's and learners' needs. There is a need for ICT hardware and software, trained personnel and connectivity to allow for effective data analysis. Once data analysis has been done, it should then be used to manage individual learners.

According to Carson et al. (2011), effective use of assessment data improves student academic achievement. This is so because the teacher can keep the academic performance of each learner and use it to monitor their performance. Stachowiak (2013) observed that teachers who regularly use assessment data to inform the decisions they make while giving instruction are more successful in improving learning outcomes. This becomes more effective if it focuses on individual learners. According to Gehlawat (2017) examination management system; supports entry, admission, results and analysis cycle in schools, provides

a means for recording the pupils' marks, grades and scores to meet the schools day to day assessment needs, and enables teachers to monitor the performance of individual and group over time and measure progress against targets, allows data storage on individual learner basis, gives a historical record of changes overtime which allows for comparison of results of different groups of pupils, used to set targets and can be used to send entries, forecast results and course work marks to parents and guardians. Data on assessment can be used to explain to the students where they are positioned and help increase their own understanding of their performance (William, 2011). This will provide feedback to the students that will enable them to move forward in their learning as well as encourage them to take responsibility for their own learning. Studies have shown that learning initiated by learners themselves is more productive than that initiated by teachers.

Learning institutions should use performance data to make decisions about the learners. Marsh et al. (2006) observed that teachers were using assessment data to make an adjustment to their teaching by tailoring instruction for the whole class based on aggregate results, dividing students into small groups and providing differentiated instructions to these groups and customising instructions for individual students. The last point was the least frequently cited strategy. There is a need to examine how the collected data has been used to guide individual learners academically.

According to Abdul-Hamid (2017), data on literacy levels enables stakeholders to use various tools to identify at-risk students and improve learning. The study further observed that if teachers have access to data on student learning in real-time, this can substantially improve teaching quality because teachers will be able to provide targeted support to students (Abdul-Hamid, 2017). Jawour (2020) established that teachers faced a number of challenges while using data in schools, including a lack of data analysis skills, a lack of time for data analysis, inadequate data management resources, organisational culture and poor leadership on data use.

3.0 RESULTS AND DISCUSSION

Questionnaire Response Rate

According to Saldiva (2012), response rate refers to the percentage of individuals who responded to a survey that was administered to them. A total of 140 questionnaires were administered on the DOS. The overall response rate was 109(77.9 %). This response rate was deemed satisfactory as it was consistent with the findings of Mugenda and Mugenda (2003) and Fowler (2002), which asserted that a response rate of 50 per cent is adequate for analysis and reporting; while a rate of 60 per cent is good, and over 70 per cent was excellent.

Demographic Information of the Respondents

The respondents were asked to note their highest level of education. The results indicated that 17(15.6%) of the DOS who participated in the study were diploma holders, 69(63.3%) were degree holders, 19(17.4%) were master's holders, and only 4(3.7%) had a PhD. These findings suggest that the DOS who participated in the study are well-educated and can efficiently handle administrative tasks using ICT, especially if well-inducted. The DOS were to indicate how long they had served in their current positions. The results

indicated that 12(11%) DOS had held their positions for less than one year. Of the DOS, 59(54.1%) have been in their respective designations for a period between one and five years and 38(34.9%) DOS have held their positions for a period of more than five years. The majority of the DOS have served in their respective positions for more than one year and are, therefore, conversant with the data under their jurisdiction. They are, therefore, in a position to comment with certainty on how they use this data to assist individual learners in their respective schools.

The respondents were also asked to indicate their highest level of ICT training. This was necessary because for them to be able to operate the database, they needed to possess some ICT skills. The results show that 14.7 per cent of DOS had not attended any ICT training, whereas 35.8 per cent of the DOS attained the skills they possessed informally. The majority of the respondents (53.9%) have a certificate in ICT training. The study has shown that most of the respondents have skills in ICT and should be able to manage a database. The respondents were to indicate how long they have used ICT to perform administrative tasks. The results showed that 16.5 per cent of DOS indicated that they never used ICT to perform administrative tasks. The majority of the DOS (82.5%) indicated that they have been using ICT to perform administrative tasks. The respondents are concerned with learners' performance and are in the best position to comment on how they collect and analyse assessment data and how the analysed data are used to manage individual learners.

The Uses of Integrated Examination Modules to Manage Individual Learners

The DOS were to respond to how they used the data in school systems to assist individual learners in various tasks related to learner evaluation. Their responses are illustrated in Table 1 below.

Table 1: Uses of the Examination Module to Manage Individual Learners

	ITEM	SD	D	MA	A	SA	MEAN	SD
		%	%	%	%	%		
1	The examination module makes typing exams easy	0	11.0	0	67	22	4.00	0.816
2	The systems in my office allow me to produce exams in mass	1.8	8.3	0.9	74.3	14	3.92	0.807
3	Exam modules assist me in analysing exams fast	0	15.6	0	67	17.4	3.87	1.064
4	I use the systems in my office to produce detailed report cards	0.9	2.8	0	61.5	34.9	3.86	0.887
5	The students' module makes it easy to communicate exam results to parents	1.8	10.1	1.8	62.4	23.9	4.27	0.689
6	The exam module makes exam grading easy	2.8	14.7	0	60.6	22	3.96	0.912
7	I have used the exam module to organise and store revision materials	11.0	18.3	4.6	45.9	20.2	3.84	1.020
8	The computerised systems in my office enable me to retrieve students' results per subject and per class.	6.4	22	6.4	47.7	17.4	3.46	1.302
9	Using the student module, I can store the progress results of individual learners	2.8	13.8	3.7	58.7	21.1	3.48	1.199

SD = Strongly Disagreed, D=Disagreed MA=Moderately Agreed, A=Agreed SA=Strongly Agreed SD= Standard Deviation

The above results show that the respondents used the module to manage assessment as suggested by the means scores slightly above average, apart from the retrieval of students' results per subject and class (3.46) and the storing of individual learners' progress results (3.48). The overall mean of the items is 3.85, which is slightly above the moderate value. This suggests that though a good number used the module to manage the learners' assessment data, a good number didn't use it.

The Impact of Integrated Examination Module on Individual Learner Management

The second set of comments directed to the DOS inquired about how the data on the exam was used to determine students for extra coaching, scheduling academic guidance and counselling for below average students, subject selection, placement into study groups and to provide revision materials to individual learners. Their responses are illustrated in Table 2 below.

Table 2: Impact of Examination Module on Individual Learner Management

	ITEM	SD %	D %	MA %	A %	SA %	MEAN	SD
1	I use graded and analysed results in the school database to determine individual learners for extra coaching	17.4	41.3	1.8	29.4	10.1	2.73	1.324
2	I use graded and analysed results in the school database to arrange for academic guidance and counselling for below-average learners.	9.2	48.6	1.8	34.9	5.5	2.79	1.179
3	I use data in the school database on academic progress to assist the individual learner in selecting subjects appropriately	11.0	46.8	2.8	29.4	10.1	2.81	1.258
4	I use graded and analysed results in the school database to place a learner in the appropriate study group	12.8	47.7	3.7	28.4	7.3	2.70	1.221
5	The created exam bank provides the individual learner with revision materials	2.8	26.6	2.8	44.0	23.9	3.60	1.195

SD = Strongly Disagreed, D=Disagreed MA=Moderately Agreed, A=Agreed SA=Strongly Agreed SD= Standard Deviation

The above results show that the examination module is rarely used to manage individual learners, as the mean values of most items are below average, apart from the item that states that an exam bank provides individual learners with revision materials (3.60). The overall mean of the items is 2.926, which is below the moderate value. This suggests that the majority of the respondents did not use the analysed data to manage individual learners.

The Relationship between the Integrated Examination Module and Individual Learner Management

The relationship was tested using the following hypothesis: There is no statistically significant relationship between integrated examination modules and individual learner management in public secondary schools in Kericho County. To determine whether there was a statistical relationship between the integrated examination module and individual learner management, data collected using a DOS questionnaire were subjected to linear regression analysis, and the results are presented in Table 3.

The linear regression model was given as follows;

$Y = \beta o + \beta_I X_I + \varepsilon$

Where Y = individual learner management, βo = is the constant term, β_I = Beta coefficient, X_I = integrated examination module and ε = error term

Table 3: Linear Regression Analysis on the Relationship between Examination Module and Individual Learner Management

MODEL	N	UNSTANDARDISED COEFFICIENTS		STANDARDISED COEFFICIENTS		
		Beta	Std error	Beta	T	Sig
Constant		3.673	.154		23.800	.000
Exam module	109	.060	.051	.112	1.163	.247
R= .112						
R^2 = .012						
p< 0.05						

The findings indicated that there existed a weak positive relationship between the examination module and individual learner management (R=0.112). This indicates that the more the respondents use the examination module, the better they are likely to manage individual learners, but the effect is very small. The reason behind this is that though the majority of the respondents use the module to collect learners' data on performance, a high percentage of the same respondents did not channel the available data towards the management of individual learners. The R^2 indicated that the examination module explained 12 per cent of the variance in individual learner management, while other factors not captured by the model contributed to the variance of 88 per cent. The findings further indicated a β coefficient of 0.060, which implies that a unit increase in the use of examination modules produces a 0.060 variation in individual learner management. The sig. (2-tailed) value is greater than .05(.247), indicating no statistically significant influence of integrated examination modules on individual learner management. The null hypothesis was then accepted that there is no statistically significant influence of integrated examination modules on individual learner management in public secondary schools in Kericho County.

The findings from the study are contrary to those of Doughety (2015), who established that the teachers in the study used reports by item or by instructional objectives to identify objectives that should be retaught to small groups of students. Secondly, the study further established that the teachers and the school leaders used student-level performance reports to place students in intervention. Finally, the results are in agreement with those by Allen (2019), who found that teachers rarely used data collected by teachers on assessment to inform instruction in the subject area or improve education outcomes.

4.0 CONCLUSION AND RECOMMENDATION

Conclusion: The study found that most respondents used the module to collect and analyse learners' data. The study further established that the respondents rarely used the available analysed data to manage individual learners. The regression test results showed a weak positive relationship (R^2=0.081) between the integrated student module and individual learner management. Therefore, there is no statistical significance (.247p>.05) relationship between integrated student modules and individual learner management.

Recommendation: The study recommended the introduction of compulsory and frequent compulsory courses on data management for all school staff members by the government, and that measures be put in place to ensure that collected data is used to make a decision on individual learners.

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